



PRELIMINARY REPORT ON SERIOUS INCIDENT INVOLVING AIRBUS A330-223 AIRCRAFT BELONGING TO DELTA AIR LINES INC. WITH REGISTRATION N858NW WHICH OCCURRED AFTER TAKE-OFF FROM MURTALA MUHAMMED INTL. AIRPORT, LAGOS ON 13TH FEBRUARY, 2018

Registered Owner and Operator:	Delta Air Lines Inc.
Aircraft Type and Model:	Airbus A330-223
Manufacturer:	Airbus
Date of Manufacture:	2006
Registration Number:	N858NW
Serial Number:	0718
Location:	Murtala Muhammed Airport
Date and Time:	13th February, 2018 at about 2252hrs

All times in this report are local time (UTC +1) unless otherwise stated

FACTUAL INFORMATION

1.1 History of the flight

On 13th February 2018 at about 2251hrs, a schedule flight DAL55, an Airbus A330-223 aircraft with registration N858NW belonging to Delta Air Lines Inc. on an Instrument Flight Rules (IFR) flight plan, departed Lagos, Nigeria, for Atlanta, United States of America with 221 passengers and 13 crew on board.

At about 2252hrs, when the aircraft was climbing out of 1700ft Above Mean Sea Level (AMSL), #1 engine Fire warning came ON. Few seconds after, the crew declared



emergency and requested for immediate air return which was approved by the ATC. The aircraft landed at about 2259hrs and stopped on runway 18R.

The Airport Rescue and Fire Fighting Services (ARFFS) reported observing fire on #1 engine and extinguished it. Passengers were evacuated using the emergency slides on the right side of the aircraft. One passenger sustained serious injury while 11 suffered minor injuries.

The incident occurred at night.

1.2 Injuries to persons

INJURIES	CREW	PASSENGERS	TOTAL IN THE AIRCRAFT	OTHERS
FATAL	Nil	Nil	Nil	Nil
SERIOUS	Nil	1	1	Nil
MINOR	Nil	11	11	Nil
NONE	13	209	222	Nil
TOTAL	13	221	234	Nil

1.3 Damage to aircraft

The aircraft was not damaged.



Figure 1: The aircraft after the incident

1.4 Other damage

Nil.

1.5 Personnel information

1.5.1 Captain (Pilot Monitoring)

Nationality:	American
Gender:	Male
Age:	60 years
Licence No.:	2962793 ATP
Licence Validity:	30th November, 2019
Aircraft Ratings:	Airplane multiengine land; A330, B757, B767, DC-9, L-188 Commercial privileges; Airplane single engine land
Medical Certificate:	Issued 11th July, 2017
Simulator:	Issued 16th October, 2017



Proficiency Check:	6th February, 2018
Route/Line Check:	30th October, 2017
Total Flying Time:	19,279hrs
Total On Type:	266hrs
Total On Type (PIC):	266hrs
Last 90 Days:	202hrs
Last 28 Days:	Nil
Last 24 Hours:	Nil

1.5.2 First Officer (Pilot Flying)

Nationality:	American
Gender:	Male
Age:	43 years
Licence No.:	664297 ATP
Licence Validity:	30th September, 2018
Aircraft Ratings:	Airplane multiengine land; BE1900, DC-9, Embraer 120, B757, B767, A320, A330 Commercial privileges; Airplane single engine land and sea
Medical Certificate:	Issued 22nd November, 2017
Simulator:	Issued 15th October, 2017
Proficiency Check:	16th October, 2017
Route/Line Check:	13th June, 2016
Total Flying Time:	5,869hrs
Total On Type:	960hrs
Total On Type (PIC):	Nil
Last 90 Days:	66hrs
Last 28 Days:	Nil
Last 24 Hours:	Nil



1.6 Aircraft Information

Type:	A330-223
Manufacturer:	Airbus
Date of Manufacture:	2006
Serial No:	0718
Registered Owner/Operator:	Delta Air Lines Inc
Registration Number:	N858NW
C of A:	Issued 25th January, 2016
Certificate of Insurance:	21st of December, 2018
Certificate of Registration:	Valid till 31st May, 2019
Noise Certificate:	Issued 7th March, 2016
Airframe Time:	51,532hrs

1.6.2 Powerplant

Engine Model:	PW 4168A-1D
No. 1:	
Serial No.:	P733582
TSN:	32,912hrs
CSN:	4368hrs
Year of Manufacture:	2005
Fuel Type Used:	Jet A-1

1.7 Meteorological Information

Time:	2200UTC
Wind:	Variable/2KTS
Visibility:	7km
Weather:	Nil
Cloud:	FEW at 1200



Temperature: 28/25°C
QNH: 1012 hPa

1.8 Aids to Navigation

ILS on runway 18R was available and serviceable at the time of the occurrence.

1.9 Communications

There was two-way communication between the aircraft and the Tower, and also between the flight and cabin crew.

1.10 Aerodrome Information

Murtala Muhammed International Airport (DNMM) has two parallel runways with designations 18R/36L and 18L/36R.

Runway 18R/36L has a dimension of 3900m by 60m, Aerodrome Reference Point (ARP) is 06°33'09"N 003°18'48"E and an elevation of 65ft AMSL.

1.11 Flight Recorders

The aircraft is fitted with Solid-State Flight Data and Cockpit Voice Recorders.

	Flight Data Recorder	Cockpit Voice Recorder
Manufacturer	Honeywell International Inc.	Honeywell International Inc.
Part Number	980-4700-042	980-6022-001
Serial Number	SSFDR-07672	CVR120-07848

The Flight Data Recorder (FDR) and Cockpit Voice Recorder (CVR) were successfully downloaded, transcribed and analysed at the Flight Safety Laboratory of Accident Investigation Bureau (AIB), Nigeria.

1.12 Wreckage and Impact Information

Nil.

1.13 Medical and Pathological Information

No medical or pathological tests were conducted.

1.14 Fire

During physical examination of the event engine in-situ, there were evidences of fire, observed from charred wires within the engine cowling.



Figure 2: Charred wires within the engine cowling



Figure 3: A close-up view of the charred wires

1.15 Survival Aspect

Emergency slides were deployed on the right side of the aircraft and passengers were evacuated. During the evacuation, 11 passengers sustained minor injuries and one passenger was seriously injured.

1.16 Test and research

Fuel samples were taken from the left engine and sent for analysis. The results indicated that the fuel was free of contaminants and within recommended standards.

A borescope inspection was carried out on the left engine. It revealed some corrosion in the turbine section and combustion chambers.



Figure 4: A view of the interior of the combustion chamber showing corrosion



Figure 5: Picture showing corrosion in the turbine section



Initial Findings

1. The flight crew were certified and qualified to conduct the flight in accordance with applicable FAA regulations.
2. The First Officer was the Pilot Flying while the Captain was the Pilot Monitoring.
3. The #1 engine fire warning came on about a minute after take-off.
4. At 2252.25hrs, the crew contacted ATC and declared emergency.
5. At about 2259hrs, the aircraft landed and stopped on runway 18R.
6. At about 2304hrs, Airport Rescue and Fire Fighting Service first reported observing smoke, and fire on the #1 engine.
7. There was evidence of fire within the engine cowling.
8. The two fire extinguishing on the #1 engine were discharged.
9. A commotion was reported onboard the aircraft before the evacuation.
10. The aircraft had no fuel-jettisoning system.
11. The aircraft landed overweight.

Further investigative actions

1. Engine examination.
2. Material testing for the fuel manifolds, engine oil and hydraulic lines.
3. Inspection of fuel manifolds for cracks.
4. Inspection of fuel nozzle braze joints for leaks.